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ABSTRACT

The two reports presented here describe an 18-month project intended to review and evaluate the first year's activities of the Office of Telecommunications Policy's (OTP) Telecommunications Demonstration Program for the delivery of social and health services; develop approaches for evaluating individual demonstration programs in the future; identify factors that have an influence on the successful institutionalization and transfer of innovative uses of telecommunications; and provide information on which to base future actions for program development and offer recommendations concerning future roles for the program. The first report provides an overview of telecommunications and the delivery of services; an overview of the Telecommunications Demonstration Program, including OTP's legislative mandate, demonstration program objectives, demonstration projects and other program-related activities, issues and problems in funding and administering projects, and program strategy implementation; planning and evaluating demonstration projects; institutionalization and transfer of demonstration projects; and recommendations for improving the program. The second report, which is in the form of an executive summary, provides a brief description of the project methodology, a review of the 12 demonstration projects undertaken by a variety of institutions including services offered and technology used, a summary of program activities, a discussion of planning and evaluating demonstration projects and barriers to their institutionalization and transfer, and organizational, policy, and project recommendations. (LMM)

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EVALUATION OF TELECOMMUNICATIONS DEMONSTRATION PROJECTS AND RECOMMENDATIONS TO THE DHEW TELECOMMUNICATIONS DEMONSTRATION PROGRAM

SUMMARY REPORT

Final Report

#146-02

Submitted to the
Department of Health, Education and Welfare
in response to
RFP 149-78-HEW-05

May 19, 1980

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EXECUTIVE SUMMARY

This report is the second in a series of reports submitted to the Office of Telecommunications Policy (OTP) of the Department of Health, Education and Welfare (DHEW) in response to RFP 147-78-HEW-05.* The goals of the contract, awarded to Kalba Bowen Associates in September 1978, were to (1) review and evaluate the first-year activities of OTP's Telecommunications Program; (2) develop approaches for evaluating individual demonstration projects in the future; (3) identify factors that have an influence on the successful institutionalization and transfer of innovative uses of telecommunications; and (4) provide information on which to base future actions for Program development and offer recommendations concerning future roles for the Program.

This volume summarizes the findings of Kalba Bowen Associates' one-and-a-half year inquiry. Sections of the report present an overview of current and future applications of telecommunications in the social service delivery context; review the evolution of the Telecommunications Demonstration Program; describe effective planning and evaluation activities and recommend cost-analysis and data collection procedures; and examine the factors inhibiting the transfer and institutionalization of demonstration projects. The report concludes with a series of organizational, program policy and project administration and oversight recommendations for improving the Program.

Other reports resulting from Kalba Bowen Associates' research include:

- Evaluation of Telecommunications Demonstration Projects and Recommendations to the DHEW Telecommunications Demonstration Program, Executive Summary Report #146-01
- Evaluation of Telecommunications Demonstration Projects and Recommendations to the DHEW Telecommunications Demonstration Program, Summary Report #146-02
- Strategies for Institutionalizing Telecommunications Demonstrations: A Review of Innovation Barriers and Program Alternatives, Final Report #146-04

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*/ During the preparation of the final reports, OTP was moved from DHEW to the Department of Education. While, in some cases, the impacts of this move are discussed within the context of the reports, we have chosen for the most part to refer to OTP/DHEW since this was the location of the Telecommunications Demonstration Program at the time of our research.

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1.0 INTRODUCTION

In 1976 Congress created the Telecommunications Demonstration Program in the Department of Health, Education and Welfare to demonstrate the use of non-broadcast telecommunications technologies in the delivery of health, education and other public or social service information. Since its inception the Program has funded a total of fifteen projects in three funding cycles. This report summarizes the first effort at reviewing and evaluating the Program, performed by Kalba Bowen Associates during 1978-79.

When the study began, the Program was still in its formative stages; eight projects had been funded and were just completing their first year of effort with various levels of success in getting their demonstration systems installed and in operation. The project team reviewed each of those projects. Thus, in addition to examining the Program as a whole, the study team has given attention to the process of conducting and evaluating demonstrations. As a result two additional reports have been prepared; one focuses on methods and procedures for developing and analyzing individual demonstration projects[1/] and the second examines institutional factors affecting the success of demonstrations.[2/]

1/ Planning and Evaluating Telecommunications Demonstration Projects, and Assessing the Costs of Telecommunications Demonstration Projects, Final Report #146-03, Kalba Bowen Associates, Inc., 1980.

2/ Strategies for Institutionalizing Telecommunications Demonstrations: A Review of Innovation Barriers and Program Alternatives, Final Report #146-04, Kalba Bowen Associates, Inc., 1980.

The Telecommunications Demonstration Program is entering its third year of operation. The initial group of projects funded will enter their third and final year of program support. Until now the Program has had to concern itself primarily with selecting and monitoring projects. With projects maturing it will have to devote considerably more time to its role in assisting the transfer and institutionalization process of the innovations it has supported. Additionally, the Program is facing reorganization into the new Department of Education. The nature and extent of the reorganization are uncertain. Thus, the Program itself is still developing. The ideas and recommendations presented in this summary report are intended to assist the Program as it continues to mature.

Section 2 of this report presents an overview of the evolution and use of telecommunications in the social service delivery context. It discusses current applications and then comments on potential telecommunications applications in the coming decade.

Section 3 reviews the Telecommunications Demonstration Program. It begins by explaining the Program's legislative mandate, and then reviews the Program's objectives, demonstration projects funded, and other activities related to the Program. Following this review, the major issues and problems faced by the Program in selecting and administering

the projects are identified,and the Program's response to these issues is analyzed. In the course of conducting this analysis, the basic program strategy for promoting the use of telecommunications is summarized.

Section 4 focuses on the role of planning and evaluation activities as they relate to telecommunications demonstration projects. It points out the importance of using planning and evaluation activities in helping the Program to more effectively promote the use of telecommunications in social service delivery. It is followed by recommendations for cost-analysis and data collection procedures which are briefly applied to those projects that had generated sufficient data to permit an analysis to be conducted.

Section 5 briefly examines the factors inhibiting the transfer and institutionalization of demonstration projects. Barriers to successful institutionalization and transfer are identified through a review of the literature on demonstration projects conducted by other programs and agencies. Based on this review several options for the DHEW program are identified.

The report concludes with a section summarizing the major issues identified during the course of this study that now confront the Telecommunications Demonstration Program. Broadly, the issues can be categorized into three

groups: organization, program policy, and project administration and oversight. Recommendations for improving the Program are then presented.

2.0 AN OVERVIEW OF TELECOMMUNICATIONS AND THE DELIVERY OF SOCIAL AND HEALTH SERVICES

2.1 Overview of Telecommunications Applications

Non-broadcast telecommunications technologies are forms of communications technology that employ discrete transmission channels for the transmittal and reception of information (audio, image, and/or textual). In contrast to broadcasting technologies, non-broadcast telecommunications typically permit a more interactive and targeted form of point-to-point communications among a known network of recipients. More than anything else, it is the capacity to reach specific audiences that distinguishes non-broadcast technologies from other forms of telecommunications.

The cost/performance ratio of communications and computing has improved dramatically, due to improvements over the last decade in the transmission capacity of telecommunications conduits (specifically, coaxial cable and now fiber optics and other high capacity transmission techniques, such as satellites), as well as major advances in computer technology (Large Scale Integrated Circuits). Thus, there has been an intense interest in identifying those application areas where new telecommunications

capabilities could be exploited to reduce costs, increase access and/or improve quality in the delivery of health, education and social services.

Advances in new telecommunications (and later in teleprocessing) technologies are generally thought to provide the following types of savings and efficiencies:

- cost reduction and/or efficiencies in information preparation, dissemination and distribution activities through facsimile, electronic message systems, satellite distribution systems, cable television, interactive cable, and other telecommunications technologies;
- more timely use of information resources and technical skills by having health, education and social service professionals employ telecommunications methods for consulting, diagnosis, referral, and the direct delivery of services over telecommunications channels:
- improved outreach to disadvantaged and remote populations by linking health, education, and social service professionals through cable, microwave, telephone, and satellite channels to groups and individuals not readily accessible, (e.g. the elderly, handicapped, rural populations, and inmates);
- improved distribution of educational materials and programs through cable television, teleconferencing, and computer conferencing;

- improved managerial and administrative productivity through teleconferencing, teleprocessing, and information management-electronic mail and distributed processing techniques;

- economies of scale by having different user groups share a common network and capital equipment; and

- specialized services for the blind, deaf, and incapacitated that otherwise could not be available or technically possible.

Given the potential of new communications technologies to improve the delivery of services and education, the question is how to design, adapt, and harness these technologies to the specific goals, resources, and environments of health, education and social services. Although it is easy to envision the potential of telecommunications for service delivery, it is quite another matter to adapt technologies to the needs of the service community, to gain the support of necessary professionals and public agencies, and to institutionalize these services on a self-supporting and cost effective basis.

While there has been an acceleration in public service use of telecommunications in recent years, telecommunications has yet to take a permanent hold as a major vehicle for the delivery of health, education, and social services. In most federal, state, and local public service agencies, the term "telecommunications" is still identified with telephone services and has yet to break out of this narrow

definition of its potential applications and uses. However, telecommunications and information processing services are in the next decade likely to assume a more critical and central function in the management and line operations of service agencies. The principal difficulties will be in creating the organizational and institutional changes needed to allow for use of communications and information functions and facilities.

While it is not possible to break down federal, state, and private expenditures currently made to telecommunications-supported services, it is apparent that telecommunications is playing an increasingly important role and that the quality, scope, availability, and cost of health, education, and social services depends in large measure upon maintaining and improving telecommunications equipment. Moreover, it is also apparent that a variety of administrative, financial, and service delivery functions may be improved through enhanced communications and information processing capabilities and that these improvements would not only affect a wide range of health, education, and social services, but also impact populations with particularly strong needs, the elderly, handicapped, and the disadvantaged. However, in order to fully exploit the potential economies, efficiencies, and increased capabilities of new telecommunications-based services, major innovations in the way service providers

conceptualize and administer their services, as well as in how end users understand their needs, must be made.

2.2 Future Applications of Telecommunications Services

The 1980's are predicted to be the decade in which major communications and computer innovations find their way into every home and business. However, based upon similar prophesies in the past, it is fairly safe to say that the rate of change will probably not be as fast as projected. While the more affluent and innovative sectors of society soon may use fiber optics, direct broadcast satellites, microcomputers, videodiscs, and other such technologies in pursuit of the "automated office" and the "integrated home information and entertainment center" the majority of society -- particularly the public service sector and less affluent groups -- will be slower to exploit such advances. The reasons are attitudinal, economic, and institutional. Technological changes that require additional expenditures and alterations in institutional attitudes and structure, even highly beneficial ones, are resisted.

These issues will affect how and who will use telecommunications in the future for service delivery. In light of the commonly-made observation that innovations proceed in a step-wise rather than leap-frog fashion, one can expect those service delivery functions to evolve in communications where current capabilities and resources are most receptive to the next increment of change.

Whereas demonstration projects might show what is possible in a specific environment, the actual adoption and institutionalization of an innovation requires approval of a wider array of people and a continuity of habits, skills, resources, and incentives.

We do not foresee the eighties as being a decade in which a great leap forward is made by service providers into the state of the art technologies of the "communications age". Rather we envision a period in which public service uses of current telecommunications technologies are upgraded, expanded, and made more efficient. Moreover, we would expect that innovations in the public service sector would by and large follow those in the private sector, with those programs and service providers with the technical and financial resources and the incentives being the leaders. Additionally, as in the case of the private sector's use of telecommunications for managerial and service delivery purposes, we expect the real bottlenecks not to be the cost or availability of hardware, but rather (1) the availability of relevant and reliable software -- not only for the production, management, and distribution of information, but also for producing program material for a broad range of educational uses; (2) the problems of public decision-making in times of tight resources; and (3) the need for changes in human and institutional behaviors.

For these reasons we foresee the following types of innovations as having the greatest potential for enhancing

the delivery of health, educational and social services in the near term:

- improved teleconferencing through innovations in speaker phones, video, and teleconferencing methods;
- electronic message systems and document distribution which will reduce the cost of document preparation and distribution. Terminals will become more widely available and easy to use; more and more information will be in an electronic form;
- low-cost satellite stations allowing for more extensive use of broadband communications for text, audio, and video;
- growth of services offering data and information for research, management, education, and training;
- reduced networking costs for data, facsimile, voice, and to some degree video transmission; data network services will become more widely available;
- distributed processing as the reduced cost of microcomputers increases the use of databanks for a wide range of information management functions.

The above telecommunications and computer advances are close to being widely available today and are likely to affect the following types of support services:

- program/project management and coordination
- record keeping, billing, and payment
- staff training and supervision
- travel costs and time
- information dissemination
- scheduling and announcements
- publication and document distribution

- information acquisition
- research
- location of field and satellite offices
- resource management
- financial and budgetary controls.

With respect to the direct delivery of services, we anticipate the impact of telecommunications to be the greatest in those areas in which the need is either highly manifest or where no alternative exists. This suggests that telecommunications will play a particularly important role in helping the handicapped -- the blind, deaf, and physically disabled. Telecommunications is also likely to play a major role in servicing isolated populations, such as rural groups, the homebound, the elderly, outpatients, and prison inmates. Below are some of the direct service applications one can expect to see receive more widespread use in the 1980's:

- electronic message systems for the deaf
- telemetric prosthetic devices
- interactive video training and education
- direct distribution and access of client-specific information
- improved health care monitoring
- interactive reading machines for the blind
- improved interactive computer assisted telediagnosis
- instantaneous referral and scheduling
- improved computer-aided instruction
- user accessed service delivery systems
- automated announcement services
- placement of low-cost service delivery terminals in the home
- telemetric instruments for remote diagnosis and treatment.

While these types of applications will be technologically feasible in the near term, they will require major adjustments

on the part of service providers and clients and therefore will not occur automatically or of their own accord. Significant institutional changes and innovations will be required over time in order to encourage different agencies to pool their resources and skills to take advantage of the potential economies of scale and service opportunities of the eighties.

3.0 AN OVERVIEW OF THE TELECOMMUNICATIONS DEMONSTRATION PROGRAM

3.1 OTP's Legislative Mandate

In June, 1976 Congress passed the Educational Broadcasting Facilities and Telecommunications Act (P.L. 94-309, 47 U.S.C. 395) creating the Telecommunications Demonstration Program in the Department of Health, Education, and Welfare (DHEW). The Telecommunications Demonstration Program, which received its first appropriation in September, 1977, is administered by DHEW's Office of Telecommunications Policy (OTP).

The Program's basic legislative mandate is to:

> "... promote the development of non-broadcast telecommunications facilities and services for the transmission, distribution, and delivery of health, education, and public or social service information."

Other provisions of this Act (1) authorize the Secretary to fund projects that "demonstrate innovative methods or techniques of using non-broadcast telecommunications equipment or facilities,"[3/] and (2) limit support of demonstration projects funded under the program to no more

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3/ The term "non-broadcast telecommunications facilities" is defined in the legislation as including, but not being limited to:

> "cable television systems, communications satellite systems, and related terminal equipment, and other methods of transmitting, emitting, or receiving images, sound, or intelligence by means of wire, radio, optical, electromagnetic, or other means."

than three years. In addition, the Act specifies (3) that the faciliites and equipment acquired and developed be used "substantially" for the transmission, distribution, and delivery of health, education or public or social service and (4) that the control and administration of a demonstration project is to be left in the hands of the applicant, including the evaluation of results, conducted at least once a year.

For historical reasons responsibility for administering the Telecommunications Demonstration Program was given to the OTP, which had been actively involved in drafting and getting passed into law the Program's enabling legislation. The OTP was established in 1970 to act as an advocate for social service interests in the formulation of telecommunications policy and as an advocate of appropriate applications of telecommunications in the delivery of health, education and social services. It was placed in the Office of the Assistant Secretary for Planning and Evaluation largely because of the "cross-cutting" nature of telecommunications policy and applications of telecommunications technology which involved all three agences in DHEW. In its early years the OTP focused primarily on policy issues and served as an advocate for social service uses of telecommunications. Its role as an advocate in the formulation of telecommunications policy was accomplished largely through involvement in inter- and intra-departmental

committees and other liaison activities. Although originally OTP had no program administration responsibilities, it played a major role in coordinating the ATS-6 satellite experiments which lead to the establishment of the Public Service Satellite Consortium. In part as a result of its experience with ATS-6, the OTP, therefore, took on a much stronger programmatic focus with the enactment of the legislation establishing the Telecommunications Demonstration Program.

While its staff members are still involved in interagency committees and activities, the OTP now serves its advocacy role more through its involvement with demonstration projects than through direct policy formulation activities. This is due to the demands of administering the Telecommunications Demonstration Program, a decline in staff, and the fact that some of the current staff members have responsibility outside the telecommunications arena. Thus, the OTP has evolved from a group whose primary focus was advocating social service interests in telecommunications policy formulation and telecommunications in social services to a group which has assumed programmatic activities with policy implications. It is not yet clear how OTP's recent move to the Department of Education (ED) will affect its status or focus.

3.2 Telecommunications Demonstration Program Objectives

Although the Telecommunications Demonstration Program's mandate is clear in its intent to fund individual demonstration projects, the language of the Act is sufficiently

ambiguous to allow considerable latitude in determining the specific objectives of the demonstrations and activities of the program. From the beginning there have been extensive discussions among the staff, the working group and the review committee on the goals of the Program. These discussions have been based on these participants' understanding of OTP's long-standing policy emphasis; however, the transition to explicit Program objectives is not yet complete.

While no formal statement of specific program objectives has been drafted by OTP, several implicit objectives have evolved during the Program's first three years. These have been identified through interviews with the program staff and a review of published OTP regulations.

The OTP is seeking to:

(1) fund projects that use existing technologies in innovative ways. The public service applications of telecommunications technologies are behind those of other fields and should be built up by increasing experience with existing technologies. In addition, restricting demonstrations to fully-developed technologies eliminates additional unnecessary risk introduced by unproven technologies;

(2) emphasize the use of appropriate technology for service delivery. It is important to avoid forcing a technology into use as a service delivery mechanism. The approach used by the program staff is to focus on innovative methods of service delivery as perceived by the providers and clients involved and then to demonstrate technologies that are likely to play a useful role.

(3) aggregate user demand for costly technologies. Service delivery using telecommunications is often capital-intensive. The shared use of an individual system for several kinds of service delivery, or by several groups or agencies for the same services, reduces the cost to any one user;

(4) actively participate in the innovation diffusion process and educate its constituency concerning the potential value and uses of telecommunications for social service delivery. Promoting the development of telecommunications for service delivery as mandated by the legislation involves more than just funding projects and disseminating the results through publications. It means actively advocating the further adoption of the concept or system demonstrated. Among the Program's constituents are the federal health, education, and welfare service delivery programs in DHEW, other agencies involved in telecommunications such as the NTIA and the FCC, state and local agencies and the client groups themselves;

(5) fund demonstrations that show promise of continuing on their own after Program funds are discontinued. While many demonstrations are primarily viewed as short-term experiments, the Program is oriented to supporting projects that will continue to develop and grow to the point where they are institutionalized in the setting where they began and beyond.

These five objectives are reflected in the criteria for the selection of demonstration projects published when the Program began. These objectives have come more into focus over time, and as the projects continue to develop and the Program matures, they can and should continue to become more specific. The initial projects are only

now completing a three-year funding cycle. There is still experience to be gained concerning the process of transferring successful demonstration concepts to other locations and/or types of services.

3.3 Demonstration Projects and Other Program-Related Activities

The Telecommunications Demonstration Program is now in its third year of operation. From its inception, interest in the Program has been high with requests resulting from the grant solicitation increasing from 500 in its first funding cycle to over 2,000 in the current funding year. Of the 500 applicants who requested the grant solicitation in the first year, ninety-five proposals were submitted and eight projects were funded (January, 1978). In the second year there were 1,600 requests for the solicitation. Of the 74 proposals submitted, five were funded (December, 1978). The Program received more than 2,000 requests for its third funding cycle; 113 proposals were received and two awards have been made to date (March 1980).

The fifteen currently funded projects involve a variety of information services in the health, education and welfare areas. Although no projects have completed the maximum 3 year funding cycle, some have already shown positive results, while others have performed inadequately. (See Appendix A). Considered together, they illustrate the ability of

telecommunications to "cut across" institutions and types of service in the delivery of information services. For example, of the fifteen grantees, six are educational institutions, five are health-related institutions and four are non-profit service organizations. More importantly, the types of services involved span the health, education and welfare fields. Five projects are primarily educational applications. Three involve telecommunications in the delivery of medical services and seven projects involve the delivery of information services to special populations such as the deaf or migrant farm workers.

Several projects also demonstrate this "cross-cutting" character internally. For example, the computer-assisted telecommunications project for the deaf (Deaf Community Center) demonstrates not only the use that electronic message services have for the deaf community, but also involves educational programming provided through a local hospital on health-related subjects and news services from the local public television station.

Of the eight demonstration projects funded in the first year (January 1978) and evaluated by Kalba Bowen staff during 1979, two projects had successfully completed their demonstration objectives. These were(1) the Telecommunications Division, State of Alabama (a state agency), and (2) the University of Denver Graduate School of Librarianship. The Alabama Telecommunications Division received funding to

demonstrate the use of UHF radio and telephone for mobile communications among emergency medical personnel in rural western Alabama. As requested, the Demonstration Program provided funding for only one year for the equipment purchase of a portion of the demonstration system. This system has performed very well. It is expected that it will be used as a standard for other emergency medical services that may be constructed in rural areas throughout the United States. Even if it is not adopted in a great number of other locations, the demonstration served its purpose of helping to focus attention on an innovative system for delivering health services. The Division of Emergency Medical Services in the DHEW, a co-monitor of the project, has taken great interest in the demonstration program.

The University of Denver received funding for a project employing telefacsimile and slow scan TV to share information resources among libraries in remote areas of a multistate region. The project formally ended November 30, 1979, but its demonstration phase was concluded six months earlier. (The final six months were spent on development of evaluation and dissemination activities). While the project did not prove feasible for continued operation, it was successful in gaining the interest of library staffs in remote areas where access to larger collections is critical. The slow scan feature, while useful, needs increased automation and higher resolution to make it an effective tool, and telefacsimile

was found to be of value only if a sufficient volume of information was transmitted. The library could not generate adequate system usage during the demonstration to make it cost-effective, and the network established during the demonstration is no longer operating. However, the results were shared with regional library groups in the western states which are exploring possibilities for networking in their regions.

The system has raised a series of interesting questions, which apply to short and long-term policy considerations:

- which information requests are truly time critical and how can this be measured;
- how are costs to be allocated for information services and should there be charges for services?
- what are the most effective techniques for marketing library services;
- what are the long-term effects of quick information access on both the library and the community; and,
- what effect will telefacsimile availability have on decision-making in communities remote from information sources?

Four projects have received continuation grants. They are: (1) the Deaf Community Center, Framingham, MA; (2) the Center for Excellence, Williamsburg, VA; (3) Pace Institute, Inc., Chicago, IL; and (4) Pennsylvania State University. The Deaf Community Center, a private non-profit service organization, received third year funds (March 1980) for the

continuation of a computer-assisted telecommunications project illustrating the usefulness of electronic message systems to the deaf community. The funding of this project has created interest in DHEW's Bureau of Education for the Handicapped (DHEW/BEH) and has had some influence on that program's decision to conduct an analysis of a possible nation-wide effort to look more closely at the problems of transmission incompatibility between teletype (TTY) and computer terminals. The Framingham project is also contributing to current public discussion concerning communications for the deaf. The FCC is conducting an inquiry into this subject and the grantee has presented its initial results, demonstrating its system before the Commission. The presentation is being entered into the inquiry docket (Docket #78-50).[4/]

The Center for Excellence (CenTex), a non-profit service organization, received third year continuation funds (March 1980) for its demonstration using FM Radio Subcarrier Communications Authority (SCA) to broadcast local news,

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4/ Since the time of our research, an ad hoc group has started to look into the possibility of incorporating a new non-profit center for computer-aided telecommunications for the deaf in Framingham and there is a strong likelihood that such a center could receive a grant from the Department of Commerce's Public Telecommunications Facilities Program to purchase equipment. Thus, it is likely that the project will be "institutionalized" and will continue at the end of demonstration funding.

announcements, entertainment services and other information services to the blind and homebound using a special audio receiver, and to the deaf using teletypewriters.[5]

Although the CenTex project is successfully conducting its demonstration agenda, the future of the concept depends on having a relatively large audience to make the service affordable. Since legal barriers prohibit the commercial distribution of the special receivers required, the limited purchase and manufacture of receivers becomes a major impediment to service growth.[6] There are also questions about the need for the services offered, given the existence of local radio and television programming, and the expected improvement in services offered by National Public Radio.

Pace Institute, Inc., also a non-profit service organization, received third year funding for its demonstration involving two-way slow scan television for educational

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5/ Since our evaluation, CenTex has begun to expand geographically and share with other stations, working with National Public Radio (NPR) on nationwide distribution. It has negotiated a reciprocal agreement with NPR's station WYCS (Yorktown, VA) to trade SCA programming materials for the blind and has a firm commitment to enter into the same kind of arrangement with WHRO (Norfolk, VA). This will give Williamsburg access to NPR programming materials and will enable CenTex to provide their services to a larger audience. In addition, CenTex has been granted use of three audio FM channels on each of three cable systems in the Hampton Road area, and has established new institutional ties.

6/ Receivers can now, however, be purchased by NTIA and are often provided as a public service or through philanthropic support.

services for inmates in correctional institutions. The project was slow in getting started because of problems in acquiring its slow scan video system and in project management. However, a marked improvement has taken place recently with the addition of a new project manager and most components of the system are now in place. PACE foresees institutionalization of family visits via slow scan and has plans to initiate family counselling services under funding from other sources. Job interviews and interview counselling will also be institutionalized. The education phase is working well under experimental conditions.

The Wernersville State Hospital, a mental institution in Wernersville, PA, unlike the three previously mentioned projects, applied for one year funding for equipment purchase for a two-way cable microwave link for use in patient education and rehabilitation programming. A primary objective of the project was to demonstrate the use of two-way cable television in providing interaction between patients and the outside community. Because of issues relating to privacy, special permits were needed. After some delay, a privacy release form was cleared by the State and the two-way interconnection is now in operation. This system is flexible and is being used in many configurations beyond community/hospital interchanges, such as closed circuit use for patient communication and staff training. Not a great deal of funding is necessary from the hospital to continue the system, since

the capital expenses have been paid.

Pennsylvania State University received funding for the demonstration of a statewide continuing education network through interconnecting cable television systems (PENNARAMA). While PENNARAMA received only a time extension during the second year without additional funds, this past year it again has received a continuation grant. The demonstration was intended to aggregate demand over a large area and, in conjunction with a consortium of other Pennsylvania institutions of higher education, provide programming to interested groups which are not large enough by themselves to obtain continuing education programming. The grantee experienced difficulties in assembling the cable network, but has recently signed an agreement with a group of cable operators from across the state. It must still complete this network and demonstrate that dispersed users can be aggregated in sufficient numbers to support network programming.

The Extension System, University of Wisconsin received funding for a demonstration to develop dial-up information services for the general public. Like Pennsylvania State University it did not receive second year funding, but has received third year funding to complete the demonstration. At the time of our initial research, this project had yet to operate because the technology required was not available at the cost originally estimated. However,

since our research was conducted, a unit of the University has come forward to perfect the necessary equipment.[7/]

The research conducted for this study included reviewing only the activities of projects funded in the first budget cycle (January 1978). Appendix A also lists projects funded in the second cycle (December 1978). At the time of our research these projects were just completing their first year and were in various stages of development. According to the Program staff, three projects in the second cycle had a portion of the system they proposed in operation at the time our research was conducted, and were expected to complete the installation of their systems and fully conduct their demonstrations. These grantees include the Spokane School District, the Medical Center Library at the University of Cincinnati, and the National Farmworkers Service Center in La Paz-Keene, California. The blood bank management project being conducted by the Tri-State Red Cross Blood Center in Huntington, West Virginia had experienced some delay in obtaining the needed equipment and was not yet operating. However, the System was

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7/ Wisconsin determined that the interface-control device required to interconnect the storage-retrieval unit and the telephone lines could be acquired most economically through the University of Wisconsin's Physical Sciences Laboratory, a design and engineering group that undertakes production of specialized equipment. A design for the device has been developed and all necessary parts are off-the-shelf. However, the necessary computer parts may involve delays in delivery due to the current inability of manufacturers to meet demand.

expected to be installed shortly, and the project was expected to complete its proposed demonstration. The project that has experienced serious difficulties was the slow-scan video and voice system for continuing medical education and physician consultation being conducted by the Medical Care Development Center. The system originally proposed required licensing by the FCC which in the end was denied. The grantee has redesigned the system so that it is telephone-based and will not require licensing.

In addition to administering demonstration projects, the Telecommunications Policy Office has also been involved in the actual promotion of the use of telecommunications for social service delivery. The major activity conducted for this purpose was a three-day workshop on the "Use of Telecommunications for HEW Services," the first conference of its kind sponsored by the Program. Approximately 125 participants from HEW and other state, federal and local agencies attended. The workshop focused on alternative telecommunications technologies and their social service applications. Also, a user forum was held to allow the Program's demonstration projects to present the results of their efforts to date. Program staff also increased their liaison activities with other HEW service programs to increase the exposure of the demonstration projects and to encourage interest in the use of telecommunications.

3.4 Issues and Problems in Funding and Administering Projects

The Telecommunications Demonstration Program is small, still relatively young, and functioning under a rather broad legislative mandate. While the Program is limited to non-broadcast telecommunications, this leaves a wide range of technologies to consider. Similarly, the program is mandated to demonstrate ways in which telecommunications can be useful in service delivery spanning the health, education, and welfare fields. Finally, the program has a mandate to support "innovative methods or technologies" but innovation may be basic or applied in service or technology. In selecting and funding its demonstration projects, therefore, the Program has faced a number of issues concerning the types, number, size, and specific purposes of the projects it supports. These basic issues may be summarized as follows:

- On what type of innovation should the Program focus?
- To what extent should the program be oriented to services and to what extent should technology development be a focus?
- Should the Program promote telecommunications uses that have national or local impacts?

The criteria for selecting proposed demonstrations as contained in the regulations published by the Program provide an indication of the directions the Program has taken. Exhibit 1 lists the selection criteria and the weighting of

Exhibit 1

CRITERIA AND WEIGHTING FACTORS FOR SELECTION OF PROPOSED TELECOMMUNICATIONS DEMONSTRATION PROJECTS

Criteria	Weighting Factor
"(1) That the project for which application is made demonstrates innovative methods or techniques of utilizing non-broadcast telecommunicatons equipment or facilities to satisfy the purpose of this authority;"	15
"(2) That the project will have original research value which will demonstrate to other potential users that such methods or techniques are feasible and cost-effective;"	10
"(3) That the services provided are responsive to local needs as identified and assessed by the applicant;"	10
"(4) That the applicant has assessed existing telecommunications facilities (if any) in the proposed service area and explored their use of interconnection in conjunction with the project;"	5
"(5) That there is significant local commitment (e.g. evidence of support, participation, and contribution by local institutions and agencies) to the proposed project, indicating that it fulfills local needs, and gives some promise that operational systems will result from successful demonstrations and will be supported by service recipients or providers;"	15
"(6) That demonstrations and related activities assisted under this section will remain under the administration and control of the applicant;"	5
"(7) That the applicant has the managerial and technical capability to carry out the project for which the application is made;"	5
"(8) That the facilities and equipment acquired or developed pursuant to the applications will be used substantially for the transmission, distribution, and delivery of health, education, or social service information, and that use of such facilities and equipment may be shared among these and additional public or other services;"	5

"(9) That the provision has been made to submit a summary and factual evaluation of the results of the demonstration at least annually for each year in which funds are received, in the form of a report suitable for dissemination to groups representative of national health, education, and social services telecommunications interests;" 15

"(10) That the project has potential for stimulating cooperation and sharing among institutions and agencies, both within and across disciplines." 15

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factors in the selection process for the first year of operation.

The first criterion as shown in the Exhibit is the basic legislative mandate, which has been given a sharper focus in the Program's solicitations. The term "innovative methods or techniques" in the solicitations is interpreted to mean "the way in which the technology is used to deliver services. A 'new technology' per se does not adequately fulfill this criterion... new technological systems are not generally what is sought...". Thus, the Program is striving to focus on the service delivery mechanism and explicitly discourages projects that emphasize unproven technologies. Implicitly, the phrase "way in which the technology is used to deliver services" seems also to discourage projects that would demonstrate new services. Program staff have stated that their intention is to support projects in which neither the service nor the technology is necessarily new (although either may be) but in which the application of the service and technology together for the first time is the innovative element.

Criteria Three and Five are evidence of the Program's focus on the importance of providing demonstrations with a strong basis in locally-identified needs. Criterion Three states that demonstrations must show responsiveness to local needs. "Local" is defined in the explanatory remarks of the solicitation as "specific target populations as well as geographical

location." When taken only in the geographic sense, local needs may preclude the demonstration from having wider applicability. However, a project that attempts to satisfy local needs of a specific target population, and also shows that similar needs exist for similar populations in other locales, has reasonable potential for being replicated. Interpreting Criterion Three in this manner increases the likelihood that the Program will fund projects that have impacts beyond the demonstration location.

Criterion Five emphasizes the importance of local commitment as an indicator of the need for the demonstration. The explanatory remarks for this criterion define the success of a project, at least in part, in terms of its promise to continue operation after federal funding ceases either by becoming self-supporting or being otherwise subsidized. From the Program staff point of view, continuation as an operational system is seen as strong evidence that the project satisfies a real local need while providing a successful working model for other locations.

Two other criteria are important indicators of how the Program mandate has been interpreted. Criterion Two states that the project should have "original research value." This is interpreted in the solicitation to mean that the data generated will have practical value in the further development of the concept or system being demonstrated. This is distinguished from a project that has a

more scientific orientation. Stated another way, the research is to be applied as opposed to basic. Criterion Ten emphasizes the significance of the institutional context of demonstration projects. The criterion and its explanatory remarks in the solicitation are important statements of the Program's interpretation of the legislative mandate. The Program's enabling legislation contains no explicit phrases concerning institutional impacts; however, the Program has interpreted its mandate to emphasize this factor. The 1978 solicitation stated in its explanation of Criterion Ten that:

> "The institutional impact... may be one of the most difficult problems and important outcomes of telecommunications applications."

This interpretation of the mandate is based on the Program staff's understanding of institutional problems that have frequently influenced the outcome of other demonstration efforts.[8/]

The Telecommunications Program therefore has formulated a basic program strategy through the evaluation criteria listed in its solicitations. The thrust of that strategy is:

- innovations the program wants to explore are of an applied rather than basic nature;
- the Program's orientation is toward developing service delivery mechanisms and is not generally toward supporting development of new technologies;

8/ For a detailed discussion of this subject, see Strategies for Institutionalizing Telecommunications Demonstrations: A Review of Innovation Barriers and Program Alternatives, Final Report #146-04, Kalba Bowen Associates, Inc., 1980.

- impacts of demonstrations are intended to be both local and to have potential applications in other locations (i.e. including specific target populations as well as specific locations).

3.5 Program Strategy Implementation

Although the Program's projects are still in various stages of development, a brief examination of the demonstrations with respect to the three strategy variables discussed above is useful. It illustrates that in its first funding cycle the Program may have been somewhat inconsistent in its funding priorities, but in the second funding cycle the Program seems to have selected projects that are more consistent with its overall strategy.

In assessing the characteristics of each project, a determination has been made as to whether the technology used and the service offered (as opposed to the service delivery mechanism) in the demonstration is applied or basic. The term "basic" with respect to technology is interpreted to mean a technology that is newly developing from an engineering standpoint.[9/] With respect to services, the term "basic" is used to indicate whether the project was in some sense using the technology to create a new service. The term "applied" with respect to technology or service is used

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9/ In interpreting the latter part of this definition, interactive television is included as a basic technology if it was unfamiliar to the grantee or the client group.

in the opposite sense. An applied technology is technically proven and relatively widely used. An applied service is one that already exists but can be provided in an improved way using telecommunications.

Three projects in the first cycle can be categorized as employing both applied technologies and services. There is little fundamentally new about the technology or the use of FM radio SCA for broadcasts such as those provided by the Center for Excellence. The innovation is that broadcasts are made to several special populations concurrently through the same service. Similarly, the use of television for continuing education is well-established, but the statewide network being attempted by Pennsylvania State University is an organizational innovation that could greatly increase access to continuing education programming. Likewise, the use of telecommunications to transmit voice and medical data in emergency medical services is in widespread use. The use of telecommunications in rural areas on a large regional basis and the simultaneous transmission of voice and data are innovations of an applied nature, although radio transmission to the telephone is new, which permits calling for information or help anywhere in the nation.

Other projects in this first funding cycle involve basic innovations. For example, the University of Wisconsin project involved the development of a new automated dialing and taped information retrieval system. The project being conducted by Pace Institute includes the use of high resolution

slow-scan video equipment. Likewise, several other projects can be considered to have created new services as part of the demonstration. For example, the University of Denver Graduate School of Librarianship demonstration involved developing a service network to share the library resources of a large urban center with remote libraries in small communities. Information sharing was accomplished using slow-scan video and telefacsimile. This was a new network and the provision of the outreach capability was a new service. A strong argument can be made that this project really demonstrated the viability of the resource sharing concept and that the use of telecommunications played a very small role in the viability of that concept. Similarly, the Wernersville State Hospital project had as its focus the use of two-way video to integrate community resources for patient education and rehabilitation. Telecommunications were to be used to reduce patient isolation and provide the mental health staff with patient remotivation and resocialization assistance. This was a new service, an extension of the Berks County two-way video demonstration, and an untested concept in mental health therapy.

The Deaf Community Center's use of electronic message systems provides a blend of basic and applied services. The service is applied in that it directly substitutes for the TTY systems now used by the deaf. It is also a

basic service in that it is capable of providing additional services such as news and consumer and health information in a videotext mode.

The projects funded in the second cycle use developed technologies more consistently than those funded in the first cycle, and avoid creating wholly new services. Spokane's educational television demonstration is innovative in system ownership and program utilization patterns which enhance the system's programming capacity. The Tri-State Blood Center will demonstrate innovation in its existing blood management program through the use of microprocessors and telephone lines. The Medical Center's Library is building on several of its other medical outreach service efforts to provide increased access from remote locations to centralized medical information and expertise. The Medical Care Development Center's project focuses on providing continuing medical education in remote locations of Maine through interconnection with an existing continuing education service. It uses a combination of slow-scan TV, microwave, telephone and closed circuit TV technologies.

Of the five projects funded in the second cycle, only the National Farm Workers Service Center is providing an essentially new service of assistance in completing welfare service applications and forms such as those needed for Social Security, food stamps, income tax, etc. To a

limited extent this service was already being provided by the Center. In short, the Program has moved toward limiting innovation to applied situations, and is reducing some of the risk involved in successfully completing demonstrations.

4.0 PLANNING AND EVALUATING DEMONSTRATION PROJECTS

Demonstration projects serve multiple functions. Their most immediate purpose is to change behaviors (and create incentives for changes in behaviors) in a specific setting. Thus, they provide a base for and are complemented by activities which raise the awareness of federal and state program managers and policymakers, stimulate and develop policy changes, and provide training, technical assistance and network support for local project managers and staff. The successful implementation of these activities is the most direct method of promoting similar applications in other settings.

Secondarily, in fulfilling their function as a "demonstration" for other locations, such projects are conducted to develop experience in the use of telecommunications for health, education and social service delivery and to generate data from this experience for use in the further development or transfer of the innovation. Thus demonstrations are, at least in part, a form of experiment in which experience at both the technical and organizational levels is to be maximized. In order to maximize the knowledge gained from the project, information collection procedures have to be explicitly designed to generate particular kinds of information; this information then can be used both by project managers to evolve project goals and strategies as the demonstration develops, and by persons interested in replicating

the demonstration at other sites.

The majority of grantees, however, have not had experience in the design or evaluation of any kind of research (i.e. data generating) projects; therefore, some projects are developed such that the objectives of the demonstrations are not clearly defined and important information such as economic data cannot be generated. This situation suggests that prior to funding projects, their specific operational objectives should be known to both the Program staff and the grantee (although clearly these goals may evolve over time). This should lead to both easier project monitoring and an increase in the knowledge gained from the demonstration.

4.1 Project Reporting and Evaluation

The purpose of the evaluation report is to document the experience gained over the project's life and to determine the degree to which the demonstration is successful in promoting the use of telecommunications in the delivery of social services. Ideally, there are three levels or tiers of success that a project can attain: 1) completing all intended project tasks; 2) demonstrating that the project concept is meeting a local need by continuing operation after Program funding ceases; and 3) transferring the project concept to other locations. Each successive level has a greater impact on meeting the Program's goal of promoting telecommunications in service delivery. Of course, levels 2 and 3

may not apply to projects that have completed only their first or second year of Program funding, so that the majority of the information contained in the grantee's evaluation will be related to the successful completion of project tasks. It should be made clear, however, that a useful evaluation is extremely dependent on a well-designed demonstration. That is, if a project is to produce the needed evaluative data, it must be designed from the beginning to generate that data.

The project evaluation report should be divided in six sections as follows:

- Statement of the Problem;
- Project Status;
- Cost Analysis;
- Barriers to Implementation and Utilization;
- Assessment of Benefits;
- Strategies for Institutionalization.

Statement of the Problem: The importance of properly and clearly formulating the "demonstration problem" is that it is the organizing principle behind the project. A properly formulated problem statement should spell out the expected benefits of using telecommunications for the concept being demonstrated. The definition of the problem influences the types of data that are generated, activities

of the project staff, and the types of external audiences that may be interested in the project. Equally important, it is extremely valuable in avoiding a pitfall that often besets technology demonstrations: taking a technological solution and finding a problem in which to use it.

Project Status: The purpose of this section of an evaluation report is to describe as specifically as possible how far along a project is in completing its demonstration agenda. Four project phases have been distinguished: start-up, trial operations, demonstration and institutionalization. Although no particular time periods for each phase can be specified, these phases are not arbitrary. They correspond to developmental periods in which project costs may differ. This portion of the report should describe project activities by phase.

Cost and Financial Analysis: A major argument for employing telecommunications in the delivery of social services is that its use is cost-effective. That is, at an identifiable volume of service delivery, it is often less expensive to use telecommunications to deliver services that to employ another method. Demonstrations must explore the economic characteristics of service delivery. The primary purposes of conducting a cost and financial analysis are to:

- Identify the structure of costs by type of resource used over the four project phases;

- Analyze cost sensitivites including the substitutability between labor and technology, the substitutability of alternative technologies, and the effect on cost of increasing the volume of services delivered over the demonstration system;

- Compare the cost of delivering services using the demonstration system to the costs of service delivery using other existing or possible delivery modes.

The identification of the structure of costs (e.g. labor, equipment, space, etc.) over time provides important financial information to others who may want to adopt or adapt the system for their own use. Analyzing cost sensitivities provides valuable data on the potential for economies of scale and may permit a determination of the optimum size of an operational system since demonstrations often serve a relatively small number of users. The comparison of costs for service delivery by the demonstration system versus other delivery methods is an analysis of cost-effectiveness. It can only be conducted when data on alternative delivery methods are available. Because demonstration projects are often unique, such comparable data may not be available, but where it is such comparisons are the true test of economic viability of the demonstration concept.

A detailed discussion of the methods and information requirements for conducting a cost analysis of a telecommunications demonstration project is presented in Assessing

the Costs of Telecommunications Demonstration Projects.[10/]

Barriers to Implementation and Utilization:

Often there are barriers to implementing the demonstration system and utilizing it for delivering the intended information services. In this portion of an evaluation report the barriers to implementation and utilization should be carefully documented. The experiences encountered by individual projects will be extremely useful to the Demonstration Program staff in identifying projects in the future that may be likely to encounter similar problems. It will also be useful to other organizations attempting to replicate the demonstration system as they may likely encounter similar difficulties.

Barriers to implementation and utilization may be classified into three categories:

- Technical
- Organizational/Institutional
- Regulatory and Legal

Technical barriers may include obstacles such as difficulty in obtaining equipment, difficulty in developing or using necessary software or difficulties in establishing and implementing

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10/ See Report # 146-03, Kalba Bowen Associates, Inc., 1980.

an effective training program.

Organizational/Institutional barriers often involve resistance by system users (e.g., clients, information providers, etc.) to using a new technology or service, or difficulties in obtaining the support or at least the acquiescence of other agencies or service organizations. Just as an innovation can be resisted by new users, it can also meet considerable resistance by other service-providing organizations that perceive tnat the demonstration will have some negative impact on their activities. To the extent possible actions taken by organizations that impact the demonstration should be documented.

Legal or regulatory impediments should generally be identified very early in the project. These might include regulations by government agencies such as the FCC, copyright laws or privacy laws.

Assessment of Benefits: Assessing the benefits of telecommunications demonstration projects is a particularly troublesome task. Often they are not quantifiable or even easily observable; frequently benefits accrue indirectly from action taken as a result of improving access to information made possible by the telecommunications based service.

Wherever possible, quantifiable measures of benefits should be used. The following are examples of types of benefit measures that may be used:

- cost savings
  - dollars per transaction, program or other unit of service
  - dollars per client
  - total dollars
- productivity gains
  - volume of information per unit of time
  - units of time saved
  - reduction in units of labor input
- access
  - number of potential and actual additional clients served
  - total volume of information available
- impact on client welfare

Care must be taken to ensure that the measures that are chosen accurately describe the service benefits received. For example, additional hours of specialized radio programming for the handicapped are not benefits unless there is an audience that listens to the broadcasts. That is, demonstration outputs do not necessarily translate into service benefits.

The assessment of benefits can be organized according to the following three points:

- Identify the beneficiaries of the project (e.g., clients, service providers, administrators) and describe how information services provided through the demonstration were previously provided.
- Present evidence demonstrating gains/losses of methods and technologies employed by the project over previous methods and services.
- Present evidence illustrating the comparative advantages (and disadvantages) of technologies and services of the project versus other available technologies and services.

Strategies for Institutionalization and Transfer: Two of the ways in which the Telecommunications Demonstration Program can promote the use of telecommunications in social service delivery are to encourage projects to continue operating after Program funding is withdrawn (i.e., to become institutionalized) and to transfer the demonstration concept to other locations that face similar service delivery circumstances. In this final section of the annual evaluation report, the grantee should articulate the role it intends to play in the institutionalization and transfer process. At the end of the first year these strategies may not yet be developed in detail, but by the end of the second year a fully developed plan should be articulated.

The approach to a strategy for institutionalization is essentially a plan to obtain revenue for continued and/or expanded operation. That plan can vary depending on the thrust of the project. In addition to specific plans for generating revenue, the institutionalization strategy should also take into account other barriers that might inhibit long-term operations. Such barriers would likely be encountered as part of the demonstration but possibly at a smaller scale. It will be necessary in this portion of the report to identify any such barriers and the plan for surmounting them.

5.0 INSTITUTIONALIZATION AND TRANSFER OF DEMONSTRATION PROJECTS

One of the Program's objectives for a demonstration is for it to become "institutionalized"; that is, for it to become a routine activity in one or more organizations where the demonstration was conducted but is no longer to operate on demonstration funds. The institutionalization of an innovation is evidence that the concept demonstrated has sufficient merit to attract resources for ongoing operation. It should be noted, however, that institutionalization does not necessarily mean that the innovative approach has been proven to be cost-beneficial compared to a more conventional approach. Also, institutionalization should not be equated with "diffusion" or "transfer," since it is possible for a service innovation to be adopted by the demonstration agency but nowhere else.

Through a review of research, we have identified several factors influencing the successful institutionalization and transfer of telecommunications demonstrations. Our review included research specifically examining barriers to institutionalization of demonstrations and the institutionalization-related results of other recent public service experiments and demonstrations.[11/] The research points to the following factors increasing the probability of successful institutionalization of demonstration projects:

11/ See Strategies for Institutionalizing Telecommunications Demonstrations: A Review of Innovation Barriers and Program Alternatives, Final Report #146-04, Kalba Bowen Associates, Inc., 1980.

- established technologies should be favored;
- the number and/or complexity of applications does not materially affect the likelihood of institutionalization (there is some evidence that the more complex the application(s), the more likely the innovation is to succeed);
- emphasis should be placed in the delivery of services to outside users rather than the initiation of changes in administrative procedures;
- applications that do not require the sharing of resources or the adjustment of operational procedures on the part of multiple institutions are more likely to succeed; however, projects undertaken by single organizations with multiple service sites are more likely to endure than local agency projects;
- the innovation must be initiated in response to locally perceived needs;
- top agency administrators should support the innovation;
- those with responsibility for the diffusion of an innovation within the agency should participate in the planning and operation of the demonstration;
- no major institutional or regulatory barriers to diffusion should be present;
- federal support should not be limited to short time periods (e.g. one year);
- planning grants do not necessarily contribute to the success of service innovations;
- risk-sharing (in some cases including cost-sharing) is closely associated with demonstration success.

From the foregoing it is clear that one of the most difficult managerial challenges for the Program will be identifying and evaluating the appropriate time and place for testing service innovations. There are several approaches that the Program can pursue individually or collectively to increase the chances that a project will be institutionalized:

1) Develop more specific project selection criteria and devote more resources to evaluating proposals before they are funded. Scrutinizing the budgetary, technical, and institutional capabilities in greater detail could increase the prospects for ultimate innovation adoption considerably.

2) Directly assist selected demonstration projects in moving from the demonstration to the institutionalization phase. Require projects to undertake institutionalization-oriented planning activities. Support these steps by providing technical assistance, helping in the promotion of worthwhile projects, serving as a clearinghouse for funding sources or technical assistance in ED and elsewhere.

3) Place more emphasis on the applicant agency's demonstrating that it has sufficient ties with external institutions and individuals who could play a role in the adoption or transfer of the innovation.

4) Develop a national "network" in telecommunications-related public service delivery. Strengthen existing efforts by developing a regular program of activities such as an annual conference; conducting special workshops on particular service areas; encouraging regular contacts among demonstration project staffs; managing a clearinghouse of funding and information resources.

Each of these approaches should be a vital component in the Program's institutionalization and diffusion strategy. But each approach requires a high staff-to-program dollar ratio. Additionally, these approaches imply that the Program should focus on a few demonstrations at a time, turning in overlapping cycles from one sector or use to another. Such constraints emphasize the need for planning and explicit decision-making to focus limited resources and use them cost effectively.

6.0 RECOMMENDATIONS

In the course of this study the problems encountered in funding, selecting, and overseeing telecommunications demonstration projects were shown to be of three types: organizational -- where should the program be located within DHEW (and now ED and what should its overall mandate and focus be?; policy -- what types of constituencies should it service and what types of impacts should it attempt to achieve?; and project -- what projects should be selected and how should they be monitored, evaluated, and promoted for adoption? The following recommendations are intended to guide the Program toward more effectively defining and realizing its mission. It is important to remember in reviewing these recommendations that in some cases they are already being undertaken in varying degrees by the Program staff; in other cases, a shortage of staff, time, and adequate funding have prevented the Program from adopting more expensive and time-consuming endeavors.

Organizational Recommendations: Since telecommunications is not a primary service, it presents somewhat of an organizational problem in determining its proper place or role within an agency such as the Department of Education. Therefore, whatever the decisions may be as to the eventual placement of the Program, they will inevitably entail tradeoffs between concerns for treating telecommunications

as an "infrastructural" service and as a specific program area. The following three recommendations are made bearing in mind these handicaps.

1) High level placement of the Program, but if possible not attached to a policy-making office. If this proves to be unavoidable, then there should be a clear division of program and policy responsibilities and functions.

Rather than being identified with any single substantive area or program, the Program should occupy an organizational slot that enables it to encourage cooperation among agencies and programs. Alternatively, policy functions should be separated from the administrative or program responsibilities and functions because the skills, resources and objectives of the two are distinct and entail different staffing and administrative requirements.

2) Continue needs assessment and coordination procedures with other agencies and programs within the Department of Education and the Department of Health and Human Services in order to help identify areas for cooperation, joint funding, and mutual assistance.

Since one of the primary goals of the Program is to help agencies and programs to identify and encourage appropriate uses and to pool their resources to make better use of telecommunications for service delivery, it is important that the Program work with these agencies in identifying their needs, assessing program priorities, and selecting projects (including joint projects) for funding. Not only should Program staff work with the staff of other programs in helping identify funding areas and in overseeing projects,

but they should also publicize their priorities and goals to other agencies that have a potential need for telecommunications. These relationships need not be highly formalized, but should be on an ongoing basis with the Program consulting with agencies and other programs on a regular basis.

3) Provide technical and informational assistance to other agencies and programs considering using or funding telecommunications systems for service delivery.

Although the limited resources of the Program would make a large technical assistance or informational support effort unrealistic, staff and/or contractors could be used both to compile information and data for the use of other agencies and programs and to provide program managers and policy makers with "hands on" experience in the selection and monitoring of telecommunications projects. In this manner the Program could become a viable focal point for expertise in the application of telecommunications to service delivery, thereby stimulating agencies to cooperate in project design and funding.

Policy Recommendations: Since its initiation, the Telecommunications Demonstration Program has been moving in the direction of funding those programs that are more service-oriented and involve less technological uncertainty. The following recommendations urge a continuation of that trend with an emphasis on projects that have immediate end

user benefits and strong prospects for the pooling of resources to achieve economies of scale.

4) Fund projects that have wide applications in the same or similar areas.

Since one of the true benefits of telecommunications is that it provides a conduit for transmission and reception of all types of services regardless of content, funding and project opportunities should be sought out that do not depend upon content or context-specific applications to succeed, but rather involve services that are needed by a variety of populations with health, social, and educational service delivery needs, which are bypassed by traditional market approaches.

5) Avoid high risk projects that entail new technological developments, new and untried software and complex and untried institutional arrangements among multiple organizations.

Typically, projects examining basic technological or service innovations have not succeeded in the past and there is little reason to believe that they will succeed in sufficient number in the future to justify their support. (See recommendation 7).

6) Fund those projects with the potential for well-defined needs and strong institutional (not personal) incentives to succeed and disseminate the results of the project.

The results of our study on barriers to institutionalization show that the success of many demonstration

projects is often contingent upon the personality and interests of the project director or key staff; once they leave, the project dies. To limit this problem the institution receiving the grant should demonstrate a clear need for the innovation or service which will encourage improvements in definition and institutional commitment as the demonstration develops.

6) Give priority to projects for vulnerable populations that are either not being served by conventional service delivery modes or inadequately served by current service delivery modes.

Not only are these groups more receptive to innovations in service delivery (since they are being inadequately served by current methods), but it is often easier to demonstrate the value and benefits of the telecommunications components of such projects.

(7) Remain open to funding some projects with a higher level of risk.

Although the majority of projects funded should emphasize stepwise advances in application of telecommunications technologies, it may be wise to reserve a small portion of funds to sponsor promising locally-initiated projects that seem more risky. These special projects could be given small amounts of seed monies to complete feasibility studies to determine whether additional funding should be forthcoming. However, if such a project successfully demonstrates its feasibility, then it should have a very high chance of receiving support the

second year.

Project Planning and Oversight Recommendations: The success of a Program in managing and monitoring its projects is in large measure determined by the amount of time the staff can put into their oversight responsibilities. The amount of time required to monitor projects, however, can be reduced to some extent by investing time from the outset in the selection process -- such as looking for those projects that have demonstrated experience in the area, strong institutional incentives to succeed, control over critical resources affecting project outcomes, and/or a minimum of outside conflicting commitments. By carefully screening projects from the outset, the likelihood of failure as well as the amount of time required to oversee and assist projects in progress can be reduced. As pointed out earlier, the Program is already engaged in the majority of efforts outlined below. They are mentioned here to stress the importance of continuing efforts in this direction.

8) Establish from the start the objectives and measures of success for projects to be funded so that projects can be evaluated in terms of the Program's overall goals and assessed for their level of risk, expected benefits and requirements for technical assistance.

A deliberate attempt should be made to select a mix of projects in terms of their level of risk so that projections can be made as to the amount of staff time required for monitoring and assistance.

9) Conduct workshops with projects so that they can be made aware of what is expected of them, share their experiences with other projects, and more effectively manage their projects.

These workshops allow Program staff as well to get a better sense of a project's capabilities and its potential needs for assistance.

10) Establish explicit criteria for feasibility assessment so that projects in the first year anticipating second year support know what is expected of them.

One of the difficulties in attracting experienced people into demonstration projects is that they are wary of committing themselves to major projects that are often funded for only one year. In order to attract the best proposals, an effort should be made to inform prospective projects of the criteria they must meet in order to qualify for second year funding.

11) Develop a standardized evaluation form for major types of projects (by objectives, technology, and service).

Work with projects in explaining what the evaluation forms mean, how they are to be filled out, and their importance for the Program and the continued support of the project.

12) Involve related funding agencies with substantive expertise in service areas to help evaluate proposals in overseeing projects.

Careful consideration, however, should be given to drawing upon the expertise of the agency that is appropriate to the project evaluation so that the time and effort of agency and Program staff is not wasted on extraneous problems and issues. Since different agencies have different levels of interest (for example, policy makers and staff are primarily interested in the initial phases and final phases of a project whereas specialists are concerned with implementation issues), an effort should be made to involve different groups and constituencies in those phases and issues that are appropriate to their expertise.

Although many of the recommendations made in this final section can be taken individually, they nonetheless are a part of a larger strategy towards funding and overseeing demonstration programs. This strategy is in part a continuation of the strategy already evolved by the Program. The emphasis is upon clarifying and sharpening the Program's mandate and having it work more efficiently with its limited resources with other agencies within DHEW and/or DOE. The techniques suggested here and throughout the report are intended to help the Program deal more systematically and explicitly with some of the problems it has encountered. Although these recommendations were made with regard to the Program's current location with DHEW, we expect that many of them will be equally valid now that the Program has been moved to the Department of Education.

APPENDIX A

Summary Description of Telecommunications Demonstration Projects by Initial Funding Cycle

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Initial Funding - January 15, 1978

Grantee	Type of Institution	Type of Service	Technology Employed	Project Status
1. Center for Excellence Williamsburg, Virginia	Private non-profit service organization	News, entertainment, announcements and educational information services to the deaf, blind and homebound.	FM Radio SCA/ audio receiver/ TTY	Continuing - system operational; received third year continuation funds.
2. Deaf Community Center Roman Catholic Archdiocese of Boston Framingham, Massachusetts	Private non-profit service organization	Electronic mailbox and information services for the deaf.	Computer/ telephone.	Continuing - system operational; received third year continuation funds.
3. Graduate School of Librarianship University of Denver Denver, Colorado	Educational institution	Information resource sharing among libraries.	Telefacsimile/ slow-scan TV/ telephone	Completed - results being disseminated, system not continuing in full operation.
4. Telecommunications Division State of Alabama Montgomery, Alabama	State agency	Emergency medical service communications for rural areas.	UHF radio/ telephone	Applied for only one year of funding for equipment purchase. Demonstration completed; entire system continuing to operate.
5. Wernersville State Hospital Wernersville, Pennsylvania	State mental health institution	Patient education and rehabilitation programming.	Two-way cable/ microwave link	Continuing - applied for only one year of funding for equipment purchase; two-way cable system in place to provide programming.
6. PACE Institute, Inc. Chicago, Illinois	Private non-profit service organization.	Educational services for inmates in correctional institutions.	Two-way slow-scan TV/telephone	Continuing - system partially operating. Project received third year continuation funds.

Grantee	Type of Institution	Type of Service	Technology Employed	Project Status
7. Pennsylvania State University University Park, Pennsylvania	State educational institution.	Statewide continuing education network.	Cable television/microwave	Continuing - beginning operation. Project did not get second year funding but received third year continuation funds.
8. Extension System University of Wisconsin Madison, Wisconsin	State educational institution.	Dial-up information services.	Automated dial access telephone information system	Proposed technology was not fully developed. No second year funding requested; third year funding received to complete demonstration.
Initial Funding - December 15, 1978				
9. Spokane School District #81, KSPS-TV Spokane, Washington	Public school system.	Elementary, secondary, post secondary and health education services.	Cable TV/two-way cable TV	Continuing and partially operating - project received second year continuation funds.
10. Tri-State Red Cross Blood Center Huntington, West Virginia	Private non-profit medical service organization.	Blood inventory management.	Microprocessors/telephone.	Continuing but not yet operating.
11. Medical Centers Library University of Cincinnati Cincinnati, Ohio	State medical health institution	Access on request by health professionals at remote sites to medical information at major medical center.	Slow-scan TV/telephone	Continuing and operating - project received second year continuation funds.
12. National Farmworkers Service Center, Inc. La Paz-Keene, California	Private non-profit service organization.	Information dissemination on social and welfare services for migrant farm workers.	Microwave/telephone	Continuing and operating.
13. Medical Care Development Center, Inc. Augusta, Maine	Medical service organization.	Continuing medical education and medical consultation.	Slow scan TV/FM radio SCA/microwave/closed circuit TV/telephone	Continuing - project delayed because FCC license was not granted. Delivery system was redesigned and funding released.

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EVALUATION OF TELECOMMUNICATIONS DEMONSTRATION PROJECTS AND RECOMMENDATIONS TO THE DHEW TELECOMMUNICATIONS DEMONSTRATION PROGRAM

EXECUTIVE SUMMARY

Final Report
#146-01

Submitted to the
Department of Health, Education and Welfare
in response to
RFP 149-78-HEW-05

May 19, 1980

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In September, 1978, Kalba Bowen Associates was awarded a contract from the Office of Telecommunications Policy (OTP) of the Department of Health, Education and Welfare (DHEW) to evaluate the first eight demonstration projects funded during the initial year of OTP's Telecommunications Demonstration Program. The specific goals of Kalba Bowen's research were to:

- review and evaluate the activities of the Program to date and develop approaches for analyzing and evaluating individual demonstration projects in the future;
- identify factors that have an influence over the successful institutionalization and transfer of innovative uses of telecommunications; and
- provide information on which to base future actions for Program development and offer recommendations concerning future roles for the Program.

Research conducted during this eighteen month project included site visits with the demonstration projects; detailed site evaluation forms completed by demonstration project personnel; personal interviews with policy-makers, funders, telecommunications project directors, and social service deliverers in other fields; telephone interviews with twelve providers in other fields; telephone interviews using telecommunications; ongoing personal and telephone contact with additional experts in telecommunications, and social service delivery; cost benefit analyses;

literature reviews; and utilization of Kalba Bowen's internal personnel expertise and resources.

Research results have been prepared in three separate reports. These are:

- Evaluation of Telecommunications Demonstration Projects and Recommendations for the DHEW Telecommunications Demonstration Program;
- Planning and Evaluating Telecommunications Demonstration Projects and Assessing the Costs of Telecommunications Demonstration Projects;
- Strategies for Institutionalizing Telecommunications Demonstrations: A Review of Innovation Barriers and Program Alternatives.

The findings of these reports and Kalba Bowen's recommendations to OTP concerning future directions for the Telecommunications Demonstration Program are summarized below.

Summary of Program Activities

Exhibit 1 summarizes the demonstration projects included in Kalba Bowen's inquiry. As the exhibit indicates, these projects were undertaken by a variety of institutions ranging from private, non-profit service organizations to educational institutions; types of services included emergency medical care, continuing education, and resource management; technologies employed ranged from telephone-computer links to the FM subcarrier band to two-way cable. At the time Kalba Bowen completed its research, two of the

Exhibit 1

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thirteen projects funded in 1978 had been completed; eight were continuing as planned and were in various stages of development; and three were either not operating and/or required major modifications in the original demonstration design.

OTP's selection of demonstration projects is based on the following three strategic components:

- innovations to be demonstrated are of an applied rather than basic nature;
- the Program is oriented toward service delivery mechanisms and is not generally supporting development of new technologies;
- impacts of demonstrations are intended to be both local and to have potential applications in other locations with similar populations and/or service needs.

When one considers the range of possible program strategies OTP could have chosen, the current strategy can be seen as one with relatively low risk. However, when seen in the light of organizational and budgetary constraints, there are several reasons for concluding that it is an appropriate basic strategy. First, the Program's appropriation is relatively small, and in real terms it is getting smaller.[1/]

[1/] Congress provided $1 million for each of the first three years. That funding level is expected to remain the same through fiscal year 1981.

With inflation running at such a high rate, each year the Program can buy less and less with its Program budget. Second, the Program has a cross-cutting mandate that includes services in many health, education, and welfare agency programs. Funding only one or two large projects would make it very difficult to serve that mandate. Third, the Office of Telecommunications Policy has a small staff whose time is not entirely devoted to the Program. Currently, two persons share responsibility for its direction, and both have responsibilities outside the OTP. Two other staff persons largely oversee the day-to-day administration of the Program, but they have other responsibilities within OTP such as involvement in inter-agency committees. Thus, it is unrealistic for OTP to adopt a strategy that would involve considerable resources in active direction of projects or in large scale efforts to affect the adoption or innovation process. Finally, the Program recently has been transferred into the new Department of Education. Facing the uncertainty of reorganization, making long-term commitments of program resources for a limited number of projects would be risky.

Planning and Evaluating Demonstration Projects

Demonstration projects serve multiple functions. Their most immediate purpose is to effect behavior changes in a specific location. Secondarily, in fulfilling their function as a "demonstration" for other locations, such projects are

conducted to develop experience in the public service use of telecommunications and to generate data from this experience for use in the future development or transfer of the innovation. In order to maximize knowledge gained from the project, information collection procedures have to be explicitly designed from the start of a project to generate particular kinds of information; this information then can be used both by project managers to evolve project goals and strategies as the demonstration develops, and by persons interested in replicating the demonstration at other sites.

Two strategies were developed by Kalba Bowen Associates to help demonstration projects standardize and simplify their evaluation efforts. KBA suggested that a project evaluation report, which should be submitted by project directors on an annual basis, should be divided into six sections:

- Statement of the Problem;
- Project Status (Start-up, Trial Operations, Demonstration or Institutional Phase)
- Cost Analysis;
- Barriers to Inplementation and Utilization;
- Assessment of Benefits; and
- Strategies for Institutionalization.

While the particular objectives of demonstration projects may lead them to emphasize one or more of these infcrmation areas, efforts should be made by grantees to be as detailed

as possible in reporting in all these topics. The types of information required in each report section are detailed in Planning and Evaluating Telecommunications Demonstration Projects.[2/]

In addition to suggesting evaluation reporting procedures, Kalba Bowen developed a methodology for assessing the costs of telecommunications demonstration projects. The methodology is organized around four major elements of analysis:

- Determination of true costs;
- Disaggregation of costs by input and by time;
- Sensitivity of costs and output to variations or substitutes for inputs; and
- Consideration of technological characteristics of the demonstration.

A detailed discussion of the methods and information requirements for conducting a cost analysis is presented in Assessing the Costs of Telecommunications Demonstration Projects.[3/]

Barriers to the Institutionalization and Transfer of Demonstration Projects

In shaping its overall demonstration strategy, OTP/DHEW (and now DOE) must be sensitive to a variety of factors which may affect its ability to be institutionalized

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[2/] Report #146-03, Kalba Bowen Associates, Inc., 1980.

[3/] Ibid.

and transferred to other locations. These factors include the inherent characteristics of an innovation, the organizational environment in which the innovation takes place, and specific implementation procedures. Through a review of research specifically examining barriers to the institutionalization of demonstrations and the institutionalization-related results of other recent public service demonstrations, KBA identified the following factors as increasing the probability of successful "routinization" of demonstration projects:

- established technologies should be favored;
- the number and/or complexity of applications does not materially affect the likelihood of institutionalization (there is some evidence that the more complex the application(s), the more likely the innovation is to succeed);
- emphasis should be placed in the delivery of services to outside users rather than the initiation of changes in administrative procedures;
- applications that do not require the sharing of resources or the adjustment of operational procedures on the part of multiple institutions are more likely to succeed; however, projects undertaken by single organizations with multiple service sites are more likely to endure than local agency projects;
- the innovation must be initiated in response to locally perceived needs;
- top agency administrators should support the innovation;
- those with responsibility for the diffusion of an innovation within the agency should participate in the planning and operation of the demonstration;

- no major institutional or regulatory barriers to diffusion should be present;
- federal support should not be limited to short time periods (e.g. one year);
- planning grants do not necessarily contribute to the success of service innovations;
- risk-sharing (in some cases including cost-sharing) is closely associated with demonstration success.

These issues are discussed in detail in Strategies for Institutionalizing Telecommunications Demonstrations: A Review of Innovation Barriers and Program Alternatives.[4/]

Recommendations

In the course of this study the problems encountered in funding, selecting, and overseeing telecommunications demonstration projects were shown to be of three types: organizational -- where should the program be located within DHEW (and now DOE) and what should its overall mandate and focus be?; policy -- what types of constituencies should it service and what types of impacts should it attempt to achieve?; and project -- what projects should be selected and how should they be monitored, evaluated, and promoted for adoption? The following recommendations are intended to guide the Program toward more effectively defining and realizing its mission. It is important to remember in reviewing these recommendations that in some cases they

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4/ Report, #146-04, Kalba Bowen Associates, Inc., 1980.

are already being undertaken in varying degrees by the Program staff; in other cases, a shortage of staff, time, and adequate funding have prevented the Program from adopting more expensive and time-consuming endeavors.

Organizational Recommendations:

1) High level placement of the Program, but if possible not attached to a policy-making office. If this proves to be unavoidable, then there should be a clear division of program and policy responsibilities and functions.

Rather than being identified with any single substantive area or program, the Program should occupy an organizational slot that enables it to encourage cooperation among agencies and programs. Alternatively, policy functions should be separated from the administrative or program responsibilities and functions because the skills, resources and objectives of the two are distinct and entail different staffing and administrative requirements.

2) Continue needs assessment and coordination procedures with other agencies and programs within the Department of Education and the Department of Health and Human Services in order to help identify areas for cooperation, joint funding, and mutual assistance.

It is important that the Program work with other agencies in identifying their needs, assessing program priorities, selecting projects (including joint projects) for funding and overseeing projects. It should also publicize its priorities and goals to other agencies that have a potential

need for telecommunications.

3) Provide technical and informational assistance to other agencies and programs considering using or funding telecommunications systems for service delivery.

Although the limited resources of the Program would make a large technical assistance or informational support effort unrealistic, staff and/or contractors could be used both to compile information and data for the use of other agencies and programs. In this manner the Program could become a viable focal point for expertise in the application of telecommunications to service delivery, thereby stimulating agencies to cooperate in project design and funding.

Policy Recommendations:

4) Fund projects that have wide applications in the same or similar areas.

Since one of the true benefits of telecommunications is that it provides a conduit for transmission and reception of all types of services regardless of content, funding and project opportunities should be sought out that do not depend upon content or context-specific applications to succeed.

5) Avoid high risk projects that entail new technological developments, new and untried software and complex and untried institutional arrangements among multiple organizations.

Typically, projects examining basic technological or service innovations have not succeeded in the past and

there is little reason to believe that they will succeed in sufficient number in the future to justify their support.

6) Fund those projects with the potential for well-defined needs and strong institutional (not personal) incentives to succeed and disseminate the results of the project.

To limit the prospect of a project collapsing once key staff leave, the institution receiving the grant should demonstrate a clear need for the innovation or service which will encourage institutional commitment as the demonstration develops.

7) Give priority to projects for populations that are either not being served by conventional service delivery modes or inadequately served by current service delivery modes (handicapped, elderly, etc.).

Not only are these groups more receptive to innovations in service delivery (since they are being inadequately served by current methods), but it is often easier to demonstrate the value and benefits of the telecommunications components of such projects.

8) Remain open to funding some projects with a higher level of risk.

It may be wise to reserve a small portion of funds to sponsor promising locally initiated projects that seem more risky. These special projects would be required to complete feasibility studies to determine whether additional funding should be forthcoming. If such a project successfully demonstrates its feasibility, then it should have a very high chance of receiving support the second year.

Project Planning and Oversight Recommendations:

9) Establish from the start the objectives and measures of success for projects to be funded so that projects can be evaluated in terms of the Program's overall goals and assessed for their level of risk, expected benefits and requirements for technical assistance.

A deliberate attempt should be made to select a mix of projects in terms of their level of risk so that projections can be made as to the amount of staff time required for monitoring and assistance.

10) Conduct workshops with projects so that they can be made aware of what is expected of them, share their experiences with other projects, and more effectively manage their projects.

These workshops allow Program staff as well to get a better sense of a project's capabilities and its potential needs for assistance.

11) Establish explicit criteria for feasibility assessment so that projects in the first year anticipating second year support know what is expected of them.

In order to attract the best proposals, an effort should be made to inform prospective projects of the criteria they must meet in order to qualify for second year funding.

12) Develop a standardized evaluation form for major types of projects (by objectives, technology, and service).

Work with projects in explaining what the evaluation forms mean, how they are to be filled out, and their importance for the Program and the continued support of the project.

13) Involve related funding agencies with substantive expertise in service areas to help evaluate proposals and oversee projects.

Since different agencies have different levels of interest (for example, policy makers and staff are primarily interested in the initial phases and final phases of a project whereas specialists are concerned with implementation issues), an effort should be made to involve different groups and constituencies in those phases and issues that are appropriate to their expertise.

Although many of these recommendations can be taken individually, they nonetheless are a part of a larger strategy towards funding and overseeing demonstration programs. This strategy is in part a continuation of the strategy already evolved by the Program. The techniques suggested here and throughout the reports are intended to help the Program deal more systematically and explicitly with some of the problems it has encountered. Although these recommendations were made with regard to the Program's location with DHEW, we expect that many of them will be equally valid now that the Program has been moved to the Department of Education.